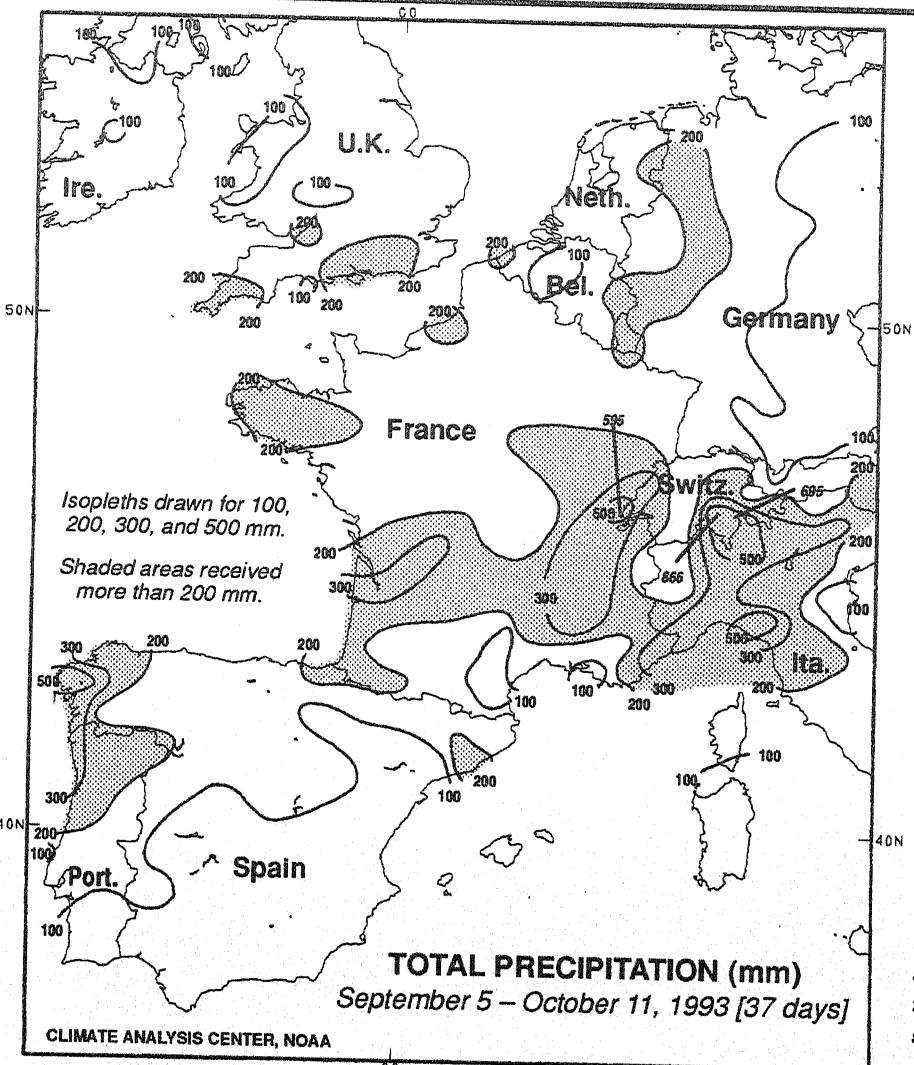


# WEEKLY CLIMATE BULLETIN

No. 93/41

Washington, DC

October 13, 1993



**MORE HEAVY RAINS GENERATE ADDITIONAL FLOODING ACROSS PARTS OF WESTERN EUROPE.** Rainfall began increasing across the western half of Europe in early September following a relatively dry period. Late in the month, excessive rains pelted portions of southern Switzerland, southern France, and northern Italy, generating floods that took over a dozen lives, according to press reports. Last week, an additional 100–250 mm of rain fell on the same region, engendering renewed flooding. Locarno, a Swiss lakeside resort, was flooded as Lake Maggiore rose to within a few centimeters of its record level reached in 1907. Farther south, a few weeks of incessant rains across southeastern France replenished drought-depleted reservoirs, but also damaged crops, delayed harvests and plantings, and forced the Rhone, Saone, and Durance rivers out of their banks at some locations, according to press reports. Road and rail links were damaged throughout the region, and dozens of dwellings were evacuated. The effects of the wet spell reached south of Rome, Italy, where mudslides caused power outages and runoff fouled drinking water, according to press reports. Since early September, over 865 mm of rain soaked parts of southern Switzerland, with totals exceeding 200 mm widespread across the southern half of France, much of Switzerland, and northern Italy as well as through other scattered areas across the western half of Europe. These totals represent between two and four times the normal precipitation through much of the aforementioned region, with surpluses of 300–500 mm accumulating in northwestern Spain, extreme southeastern France, southern and western Switzerland, and north-central Italy.



UNITED STATES DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL WEATHER SERVICE—NATIONAL METEOROLOGICAL CENTER  
**CLIMATE ANALYSIS CENTER**





# GLOBAL CLIMATE HIGHLIGHTS

MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF OCTOBER 9, 1993

## 1. Alaska:

### **WET WEATHER PREVAILS.**

Up to 180 mm of precipitation fell on the central and southern sections of the state, and six-week moisture surpluses remained as high as 300 mm [6 weeks].

## 2. West-Central North America:

### **STILL VERY DRY.**

Less than 20 mm of rain was observed as the slow start to the wet season continued. Since early September, precipitation shortfalls approached 230 mm in British Columbia and 180 mm in Washington (page 2) [7 weeks].

## 3. Central United States:

### **SHORT-TERM MOISTURE CONDITIONS IMPROVE.**

Scattered showers dropped 20 to 40 mm of rain on parts of Nebraska and Iowa, but most other areas received little or no precipitation. Six-week moisture excesses, however, remained as high as 300 mm at isolated locations, particularly in southwestern Missouri [Ended at 34 weeks].

## 4. Central Gulf Coast:

### **RAINFALL DEFICITS PERSIST.**

Moderate rains (50 to 80 mm) dampened isolated sections of Florida and Texas, but little or no precipitation was reported elsewhere. Moisture deficits approached 150 mm at several locations along the Gulf Coast [15 weeks].

## 5. Central South America:

### **COLD AIR REMAINS ENTRENCHED.**

Large sections of southern Bolivia, northern Argentina, and western Paraguay reported temperatures averaging 4°C to 6°C below normal as the cool spell persisted [8 weeks].

## 6. Uruguay:

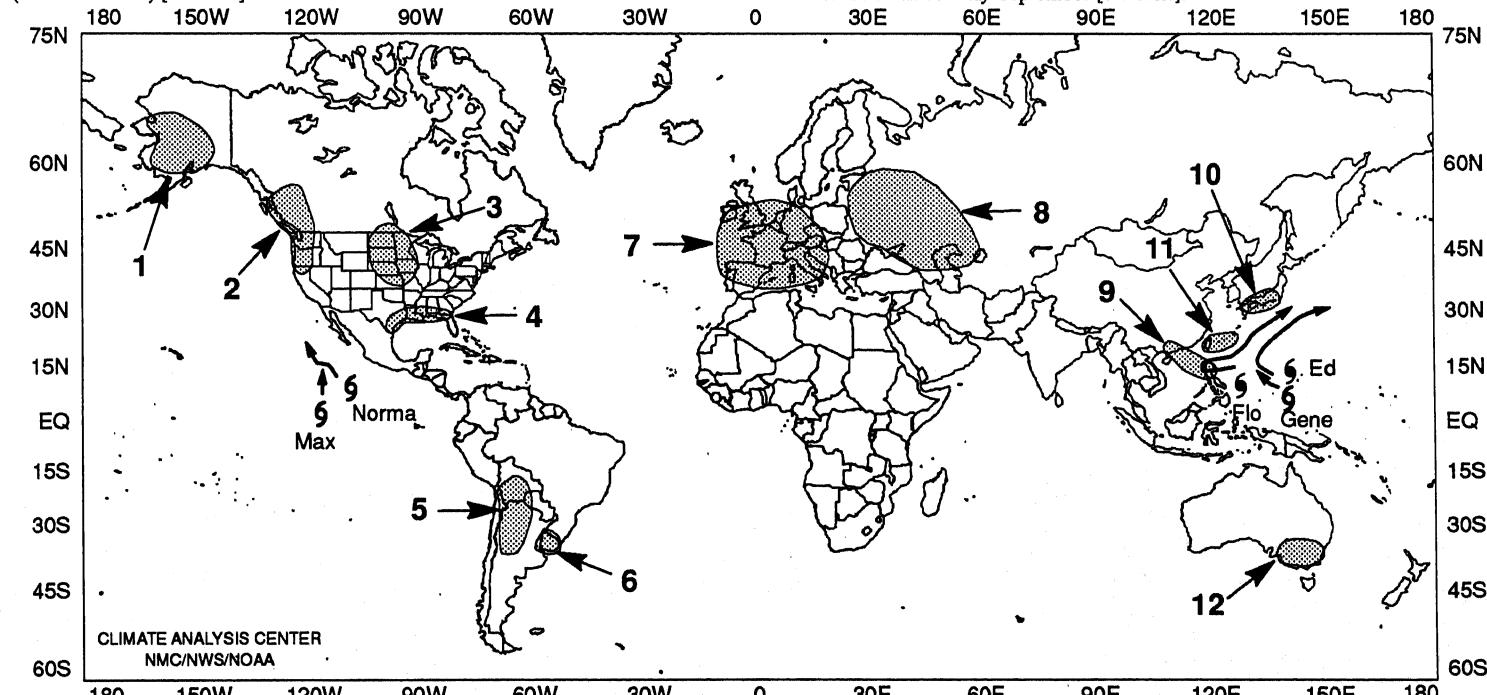
### **DRY WEATHER CONTINUES.**

Little or no rain was reported across the country, except for isolated amounts approaching 30 mm in far northern sections. Since early September, rainfall deficits climbed to 100 mm at some locations [15 weeks].

## 7. Western Europe:

### **MORE STORMS BATTER CONTINENT.**

Heavy showers inundated southern France and northern Italy with almost 200 mm of rain while amounts approaching 300 mm drenched the higher elevations of Switzerland. According to press reports, additional flooding cut road and rail links to Cannes (see front cover) [5 weeks].

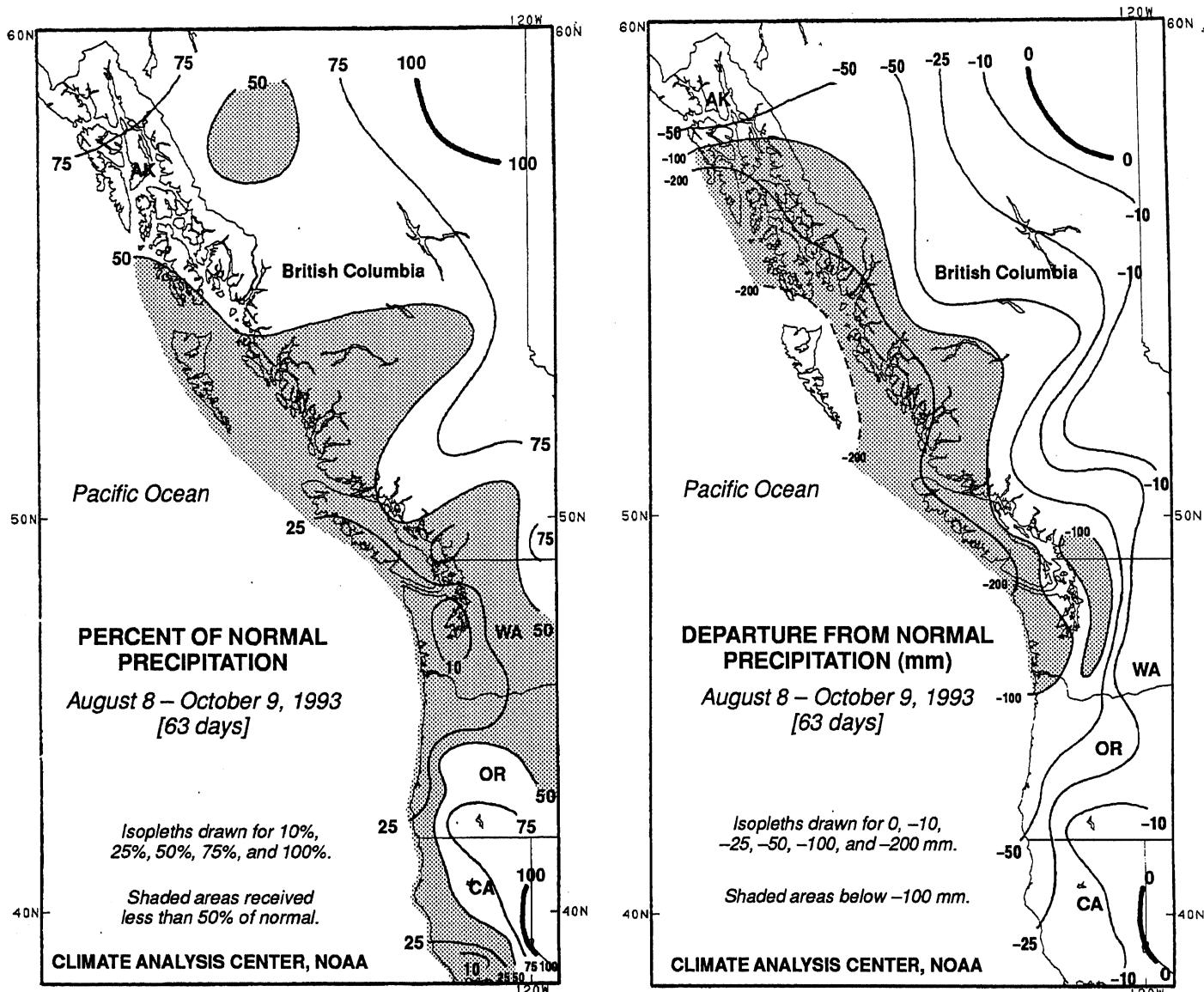


## EXPLANATION

TEXT: Approximate duration of anomalies is in brackets. Precipitation amounts and temperature departures are this week's values.

MAP: Approximate locations of major anomalies and episodic events are shown. See other maps in this Bulletin for current two week temperature anomalies, four week precipitation anomalies, long-term anomalies, and other details.

# GLOBAL CLIMATE HIGHLIGHTS FEATURE



**A SLOW START TO THE WET SEASON OBSERVED ACROSS WEST-CENTRAL NORTH AMERICA.** The typical increase in precipitation observed in late summer and early autumn has been slow to develop this year, with subnormal early-season precipitation observed across western British Columbia, the Pacific Northwest, and northern California. Since early August, under 25 mm of rain fell on most of the northern half of California, central and northwestern Oregon, parts of central and west-central Washington, and central Vancouver Island. Elsewhere, totals of 25–50 mm, with some reports of 50–215 mm in west-central and northeastern British Columbia, represent under half of normal at many locations. In the last 63 days, deficits exceeding 100 mm have accumulated across the higher elevations of west-central Washington, along the Washington coastal plain, through southwestern British Columbia, and along the southern Alaskan Panhandle. These conditions differ sharply from those observed early in the 1992–1993 wet season, which featured exceptionally heavy precipitation through most of British Columbia but drier than normal weather across the western half of Oregon and northern California.

# UNITED STATES WEEKLY CLIMATE HIGHLIGHTS

## FOR THE WEEK OF OCTOBER 3-9, 1993

A powerful cold front plunged into the central portions of the nation during the latter half of the week, bringing the season's first winter storm to the northern and central sections of the Rockies and High Plains, spreading moderate to heavy rain over the middle Missouri, middle and lower Mississippi, Ohio, and Tennessee Valleys, and ushering cold Canadian air into the Rockies, the Plains, the Mississippi and Ohio Valleys, and the Great Lakes. Up to a foot of snow blanketed parts of Montana, Wyoming, western South Dakota, and the Nebraska panhandle on Thursday and Friday while severe thunderstorms developed ahead of the front, spawning tornadoes and locally heavy downpours. Three inches of rain fell in one hour at Crete, NE. Record warmth preceded the front as a number of daily high temperatures records were set in the central and northern Plains on Wednesday, across the upper Mississippi Valley and Great Lakes on Thursday, and along the Appalachians on Friday. Behind the front, subfreezing temperatures dipped southward into northern parts of the southern Rockies, the southern High Plains, the middle Missouri, middle Mississippi, and Ohio Valleys, and the central Appalachians. Elsewhere, heavy rain drenched portions of the southern Intermountain West. On Wednesday, Scottsdale, AZ was deluged with 3.7 inches in several hours (about three times its average monthly rainfall).

At the beginning of the week, showers and thunderstorms dampened the eastern half of Texas, Florida, the middle Atlantic coast, and New England along and ahead of an eastward-moving cold front. Strong thunderstorms in the warm, humid air ahead of the front generated locally heavy rain in eastern Texas and southern Florida and high wind gusts that downed trees and power lines and destroyed property west of San Antonio, TX. Elsewhere, showers were scattered across the upper Great Lakes ahead of a cold front moving southward out of Canada while warm weather prevailed in the West, where daily record high temperatures were set in the Pacific Northwest and the desert Southwest. Farther west, heavy rains caused localized flooding on the Big Island of Hawaii. By Tuesday, the eastern front moved out to sea (bringing more rain to the Florida peninsula). Meanwhile, the second front raced eastward toward the Atlantic, spreading rain across the lower Great Lakes and the Northeast. This second front produced little rain, but ushered cooler air into the northeastern quarter of the nation. Unseasonably warm and humid conditions continued to dominate the West, with thunderstorms scattered over the Great Basin and more than a dozen high temperature records established in the Rockies and Intermountain West on both Monday and Tuesday.

During the middle of the week, a low pressure system developed along the southward-moving front which stalled over

southern Florida, bringing rain, with locally heavy amounts, to much of Florida. Meanwhile a strong cold front surged southward out of Canada, producing widespread precipitation from the Pacific Northwest to the northern Plains. Thunderstorms also developed over parts of the southern Intermountain West and eastern Great Basin. During the latter part of the week, the cold front pushed southeastward, bringing snow to the northern and central Rockies and northern and central High Plains and rain from the central and southern Plains eastward to the lower Mississippi Valley and Appalachians. In the meantime, the Atlantic low pressure system moved northeastward, spawning heavy showers along the immediate eastern seaboard. At week's end, showers spread into northern California ahead of a Pacific Ocean storm system.

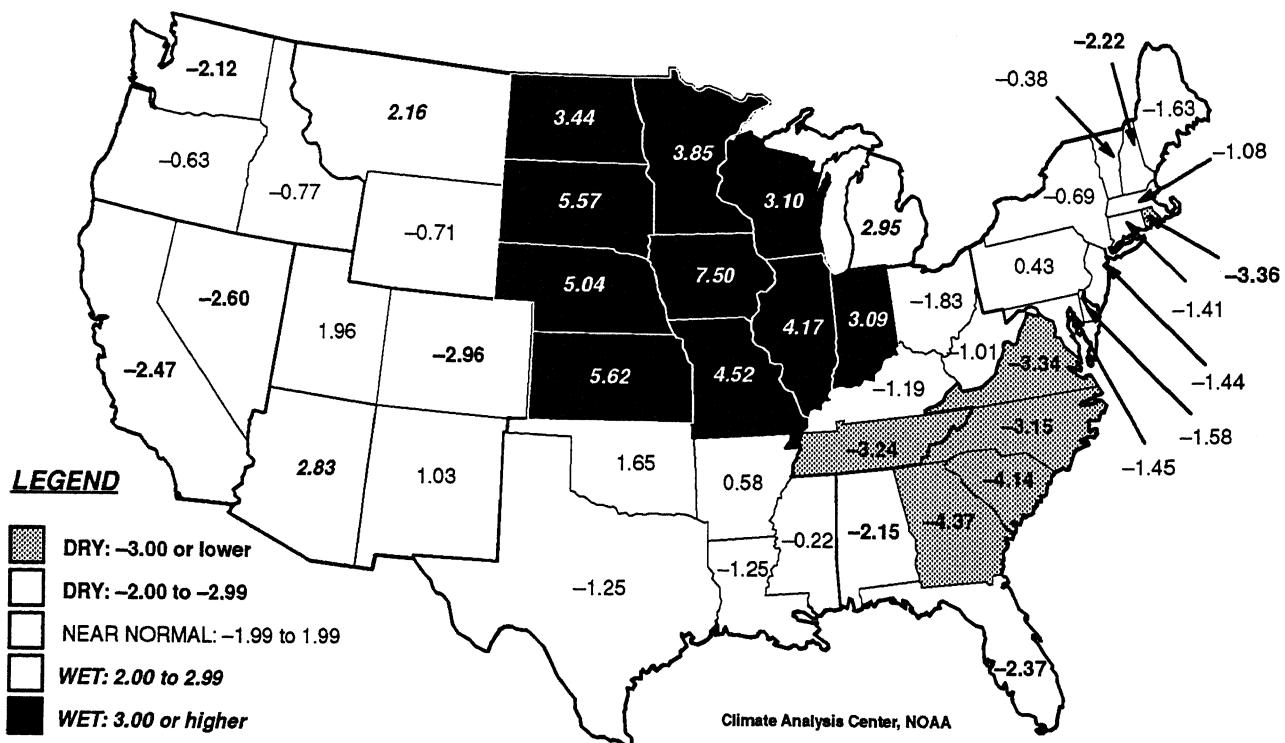
According to the River Forecast Centers, the greatest weekly precipitation totals (between two and seven inches) fell across the southeastern Plains, the western portion of the lower Mississippi Valley, the Florida peninsula, and central Arizona. In addition, heavy rains inundated portions of the south-central coast of Alaska, Kauai, and the Big Island of Hawaii. Scattered amounts exceeding two inches were also reported in the middle Missouri Valley, with similar widely scattered totals across the central Rockies, the upper Great Lakes, the Ohio Valley, the northern Appalachians, the northern Sierras, and the remainder of the Missouri Valley. Light to moderate amounts were measured in the Pacific Northwest and the remainders of northern California, the Intermountain West, the Rockies, Alaska, and the eastern two-thirds of the nation. Little or no precipitation was reported in the southern half of California and the remainder of Hawaii.

Warmer than normal conditions prevailed over much of the western quarter of the nation, the southern Rockies, the central and southern Plains, the middle and lower Mississippi Valley, the Southeast, the central Appalachians, and portions of the central Rockies, the Ohio Valley, the mid-Atlantic, and the Northeast. Weekly departures of up to +5°F were found in portions of the Pacific Northwest and desert Southwest. Abnormally warm weather also dominated Alaska, with weekly departures ranging to +10°F at Barrow. Furthermore, temperatures averaged 2°F to 3°F above normal across Hawaii.

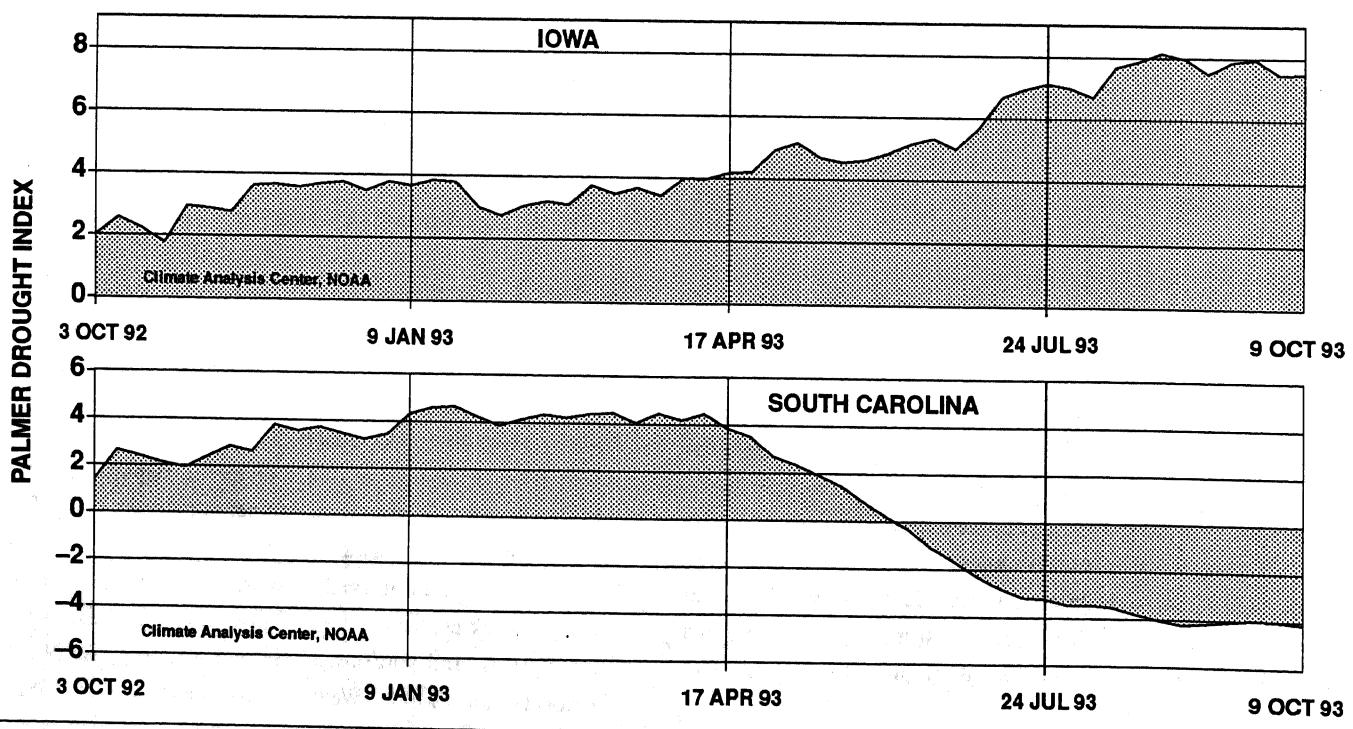
Cooler than normal conditions covered most of the northern Rockies, the northern Plains, the upper Mississippi and Ohio Valleys, and portions of the mid-Atlantic, the Northeast, California, and Florida. Weekly departures less than -3°F were limited to portions of the northern and central Rockies and the northern Plains.

# NORTH AMERICAN CLIMATE HIGHLIGHTS

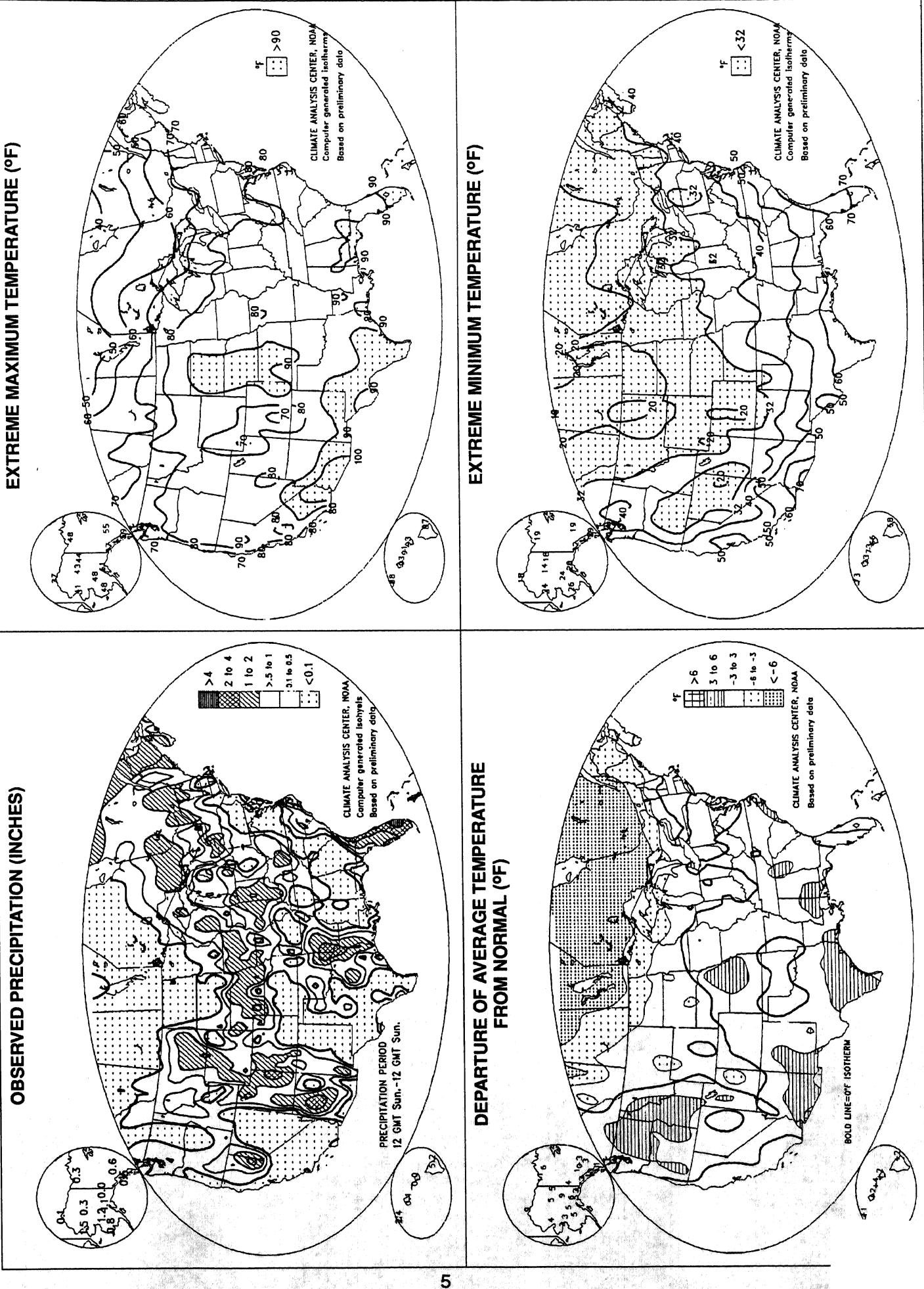
## PRELIMINARY PALMER DROUGHT INDEX AS OF OCTOBER 9, 1993



**AREA WEIGHTED PALMER DROUGHT INDEX (PDI) BY STATES**, as computed by the Climate Analysis Center. Little has changed during the last month in those parts of the country experiencing the most extreme conditions: The Midwestern wetness expanded subtly eastward, and the Southeastern drought conditions improved along the northeastern fringe of the region, but significant shifts in intensity or areal extent were not detected. The biggest changes in statewide PDI values were noted in the northeastern and northwestern corners of the country. Long-term moisture budgets improved markedly in the Northeast, with five states increasing by at least one index unit, while moisture deficits became larger in Washington. Note that, although the negative impacts of the extreme conditions have decreased recently (largely because the growing season has ended), long-term moisture conditions have changed little since early September in Iowa and South Carolina.

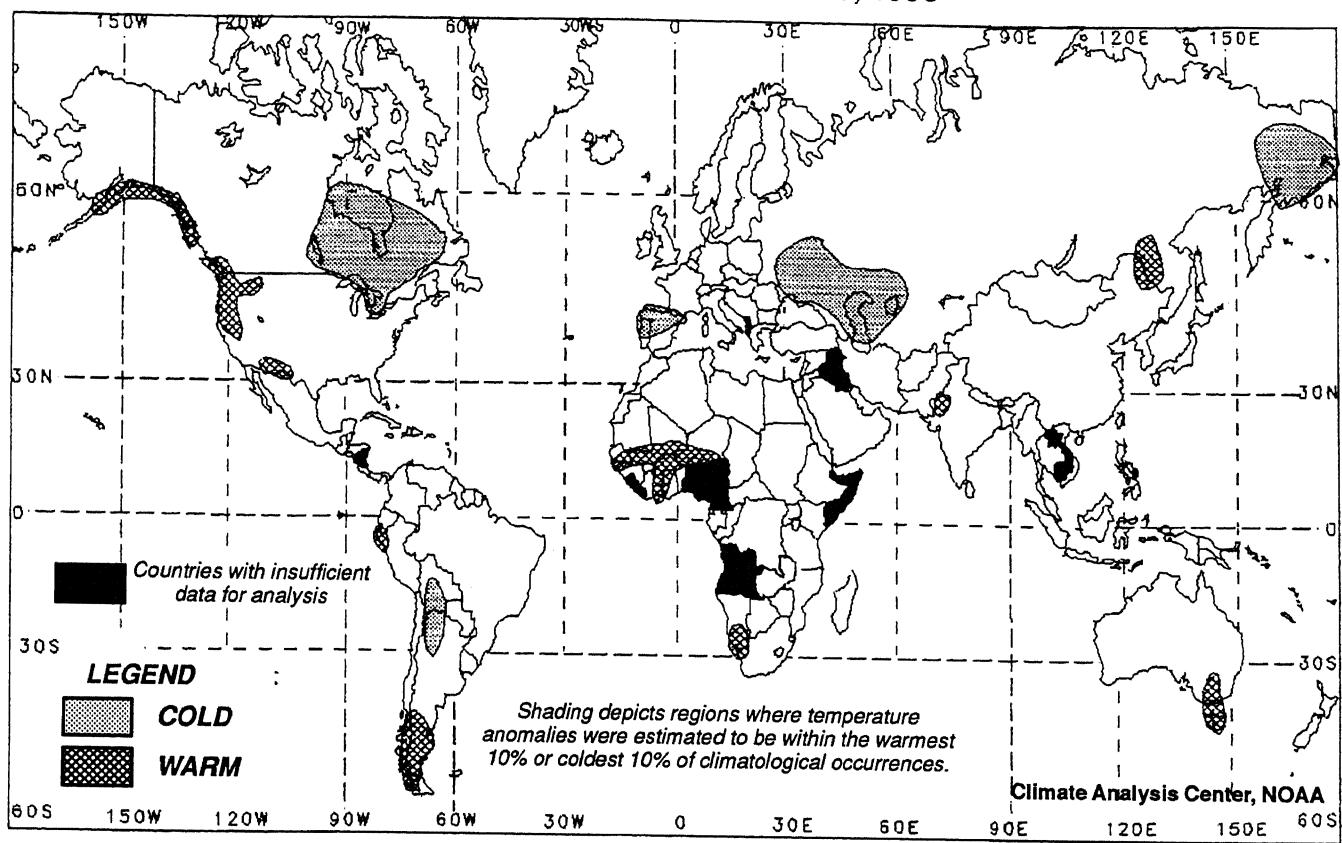


# UNITED STATES WEEKLY CLIMATE CONDITIONS (October 3 – 9, 1993)



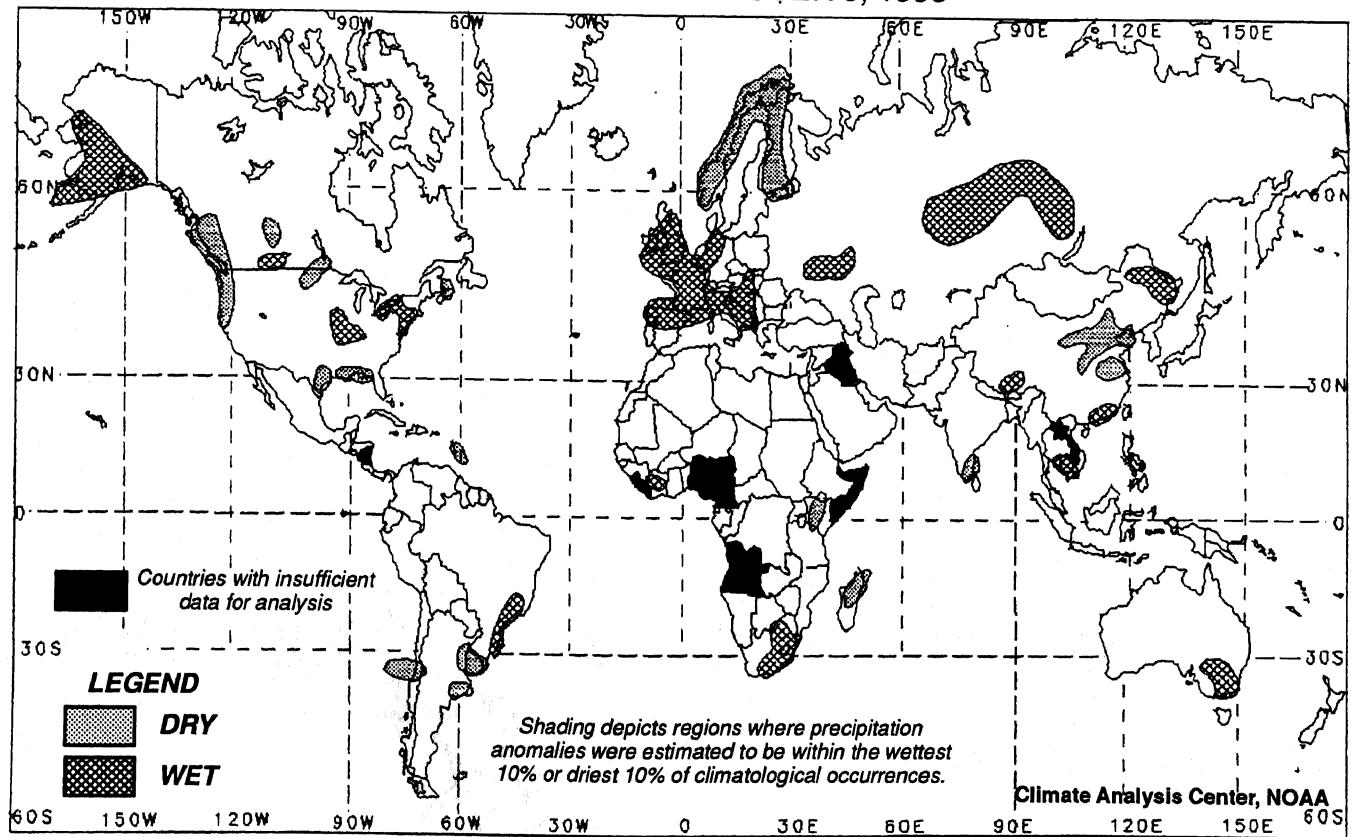
## TWO-WEEK GLOBAL TEMPERATURE ANOMALIES

SEPTEMBER 26 – OCTOBER 9, 1993



## FOUR-WEEK GLOBAL PRECIPITATION ANOMALIES

SEPTEMBER 12 – OCTOBER 9, 1993



## **CORRECTION:**

*Page 4 of the Weekly Climate Bulletin #93/34 contained a depiction of rainfall for the Aug. 8–15 period across the northeastern mid-Atlantic region. Values of 6–13 inches were analyzed in central New Jersey, based on two River Forecast Center (RFC) reports and a press report describing "the worst flooding in ten years north of Philadelphia." This episode was also referred to in the August monthly and Summer seasonal Climate Summaries for the United States. Discussions with the New Jersey state climatologist have revealed that the two RFC reports on which this analysis was based erroneously entered our files. Rainfall totals on the order of 2–6 inches fell during the period in this region. The Climate Analysis Center is looking into the process by which these totals entered our files in an effort to avoid these errors in the future; however, the producers of the Weekly Climate Bulletin wish to reiterate that ALL DATA APPEARING IN THIS BULLETIN ARE BASED ON PRELIMINARY REPORTS. Although quality control measures are taken, the quantity of data flowing into the Climate Analysis Center each day does not allow for the independent scrutinization of each individual datum. Please, therefore, use these data with caution.*

## **NOTE:**

*A delay in the receipt of several monthly products has forced the Weekly Climate Bulletin to postpone publication of the September 1993 U.S. Climate Summary. It will be printed as soon as the Climate Analysis Center receives the delayed products.*